THE

Malayan Agricultural Journal.

FEBRUARY, 1941

EDITORIAL.

Mulching.

The necessity of protecting the soil from prolonged exposure to the sun as well as from erosion, by the maintenance of a vegetative covering is an accepted principle in Malayan agriculture. On rubber estates this is usually achieved by the establishment of cover crops or by some form of selective weeding. On coconut estates natural growth is allowed to form a cover, to be slashed at regular intervals, while in market gardening for the cultivation of many annual crops this object is achieved by a mulch of grass or by the provision of light shade.

Recent investigations in this and other tropical countries which experience heavy rainfall have advanced the claims of mulching as a means of protecting the soil, and the application of a mulch in the cultivation of coffee, which forms the subject of an article in this number, has proved to be highly successful.

A mulch is a layer of material, not necessarily of any manurial value, spread over the soil with the objects of shading the surface of the soil, of conserving the supply of water in the soil by limiting evaporation, and of preventing surface wash during rainy weather.

With Liberian coffee grown at an elevation little above sea level, the application of a mulch consisting of cut wayside grasses, at the rate of 20 tons per acre annually, resulted in an almost immediate improvement in the appearance of the bushes. The yield, however, showed no improvement until the second year when an increase of 127 per cent. was recorded, while the indications were that this improvement would be maintained. The beneficial results of mulching coffee under the conditions of this experiment are therefore beyond doubt.

How far this improvement is due to the physical effect of the mulch and to what extent it is due to the manurial value of the material forming the mulch cannot be gauged with accuracy. The author noted a considerable improvement in the physical texture of the soil, for whereas the unmulched soil became baked hard, hot and dry during hot weather, and suffered from considerable surface run-off in times of heavy rainfall, the mulched soil was cooler and softer, moist and porous, while the force of rain was broken by the mulch, and almost all the water absorbed by the soil. Chemically too, the soil must have benefited by the application of the mulch for it was estimated that 20 tons of the grass mulch contained 170 lbs. of nitrogen, 40 lbs. of phosphoric acid and 160 lbs. of potash.

Evidence of the benefit derived from mulching compared with the application of manures is supplied by the author in a series of experiments extending over a period of 12 months. The results showed that mulching alone gave a yield 55 per cent. greater than the best of the manurial treatments. The latter consisted of the application of 4 cwts. of rock phosphate together with 2 tons of green manure incorporated into the soil.

The experiments have not yet reached a stage when the economics of mulching can be closely studied.

Small applications of mulch are useless, for the material disappears rapidly and an effective cover cannot be maintained. On the other hand, an application of 20 tons of mulch per acre may prove to be excessive. As an alternative, mulching material of a more hardy nature may possibly be found which will resist weathering for longer periods and which may therefore be used in smaller quantities. This question of quantity of mulch is important because many estates cannot procure sufficient quantities for mulching without incurring heavy transport costs, and in any case the transport of mulch is apt to prove an expensive item. The author recognises these limitations but points to the possibility of applying mulch on the poorer areas of an estate and the practicability of small-holders making use of mulch. Most of the coffee grown in Malaya is contained in small holdings so that propaganda in that direction might result in early improvement. The main issue in connexion with mulching, however, still remains in doubt, namely, whether large scale mulching is practicable. If economic mulching is possible, we anticipate a very steady development in the practice and early enquiry concerning the application of this system to a wide range of crops in Malaya.

Original Articles.

COFFEE MANURIAL AND MULCHING EXPERIMENTS

By
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A. *Coffea liberica* or Liberian Coffee.

Introductory.

Articles on the cultivation of coffee in Malaya have been published in previous numbers of this Journal, ([1], [2] & [3]), but only general advice regarding manuring has been given since few experimental data were then available.

The present paper records the results of a manurial experiment laid down in 1933 and of a mulching experiment superimposed on part of the area at the suggestion of Sir Frank Stockdale, then Agricultural Adviser to the Secretary of the State for the Colonies, on his visit to this country in 1938.

The results of the mulching have been most spectacular both in the appearance of the bushes and in their improved yields. The findings agree with recent work in the Netherlands Indies([4]) where it is stated that on light soils very good results have been obtained by a combination of manuring with nitrogen and phosphate and mulching with legumes grown as a cover crop between the rows of coffee.

Site of Experiment.

These experiments have been conducted at the Central Experiment Station, Serdang, on land situated about 150 ft. above sea level.

The young seedling coffee was planted 12 ft. x 12 ft. square in 1933 in a sandy clay loam of the Hill Quartzite series on an area of gentle slope. During the previous ten years the area had been under illipe nuts (*Bassia latifolia*) and annatto (*Bixa orellana*) both of which were cut out at the end of 1932 when the land was cleared for the coffee. The coffee seedlings were planted in previously prepared holes dug 3 ft. cube and filled with turf, other organic matter and top soil.

At the time of planting, green manures (*Crotalaria anagyroides* and later *C. usaramoensis*) were sown between the rows of coffee and in December, 1934, cuttings of the low-growing shade tree *Gliricidia maculata* were planted 12 ft. apart between alternate rows. In March, 1938, the number of *G. maculata* trees in the Treatment "D" plots was doubled.

Soon after the coffee was planted, small earth bunds were made around each plot in an attempt to prevent wash of soil and manures from one plot to another. The early weeding policy was to clean-weed at monthly intervals and to heap the weeds between the rows. In June, 1935, the soil was so hard and dry and the bushes looked so poorly that it was decided to mulch the cut weeds around the bushes in

a broad circle. In May, 1938, the policy of clean-weeding was modified to one of selective weeding, cutting out all the grasses and perennials but leaving the annuals to form a cover and give protection to the soil. An inspection of the area at that time showed that considerable sheet erosion had taken place and in an endeavour to reduce further erosion silt pits 2 ft. wide and 2 ft. deep were dug throughout the area at varying distances apart according to the slope of the land.

Manurial Treatments.

Four manurial treatments have been applied since the experiment was commenced. They are:—

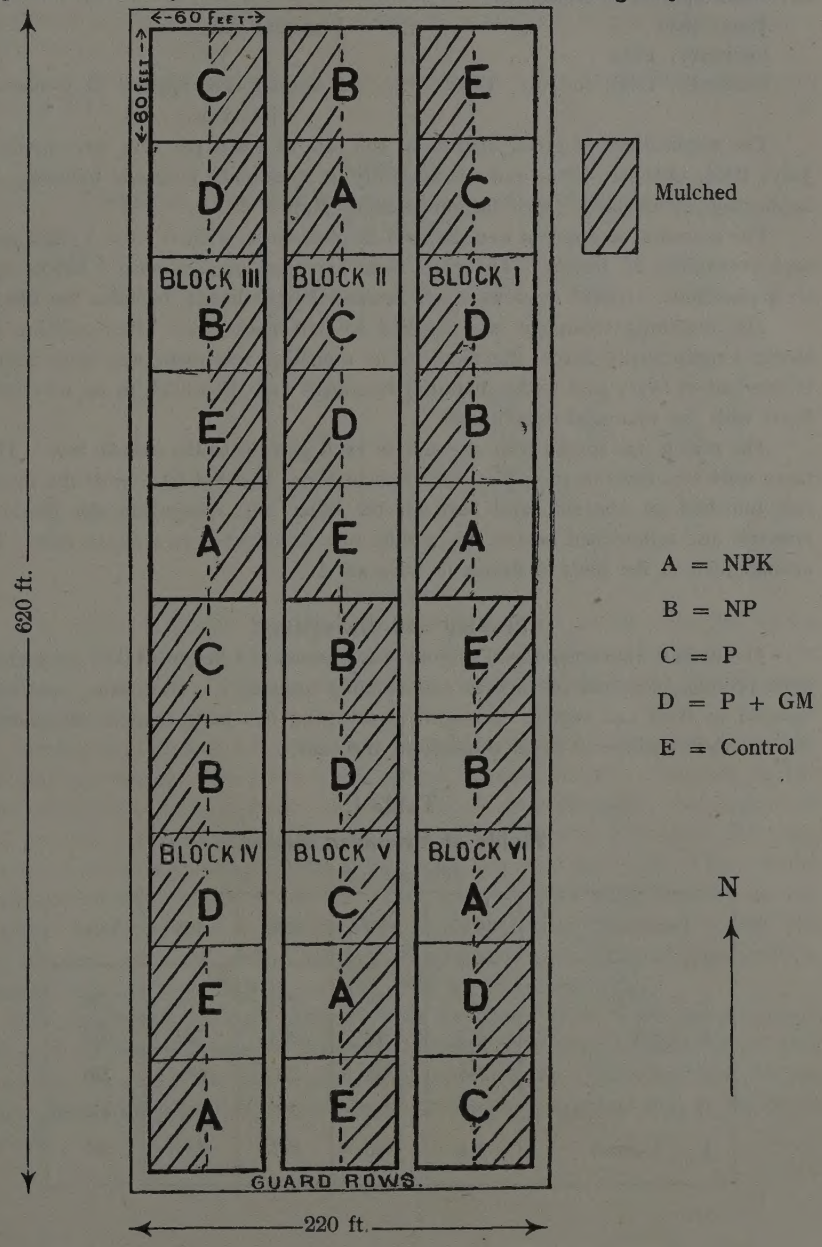
		cwts. per acre per annum.
A = NPK	Sulphate of ammonia	1
	Superphosphate	2
	Sulphate of potash	1
	Total	4
B = NP	Sulphate of ammonia	2
	Rock phosphate	2
	Total	4
C = P	Rock phosphate	4
D = P + GM.	Rock phosphate	4
	Green manure	40
E = Control		No manure.

The green manure in treatment "D" consisted of clippings of leguminous plants such as Crotalarias buried in a shallow semi-circular trench under the margin of the branch spread. The application was made alternately on the north and south sides.

The artificial manures were applied at the calculated dressings per bush. Dead leaves and weeds and later the grass under the mulched bushes were first scraped away. The manures were then broadcast in a broad circle extending from the stem of the bush to the margin of the branch spread, and lightly dug under. The leaves and grass were then raked back under the bushes.

DIAGRAM I.

Experimental Lay-out of Coffee Manurial and Mulching Experiment.



The artificial manurial dressings were commenced a year after planting and have been applied as under:—

June, 1934	... ...	¼ annual rate.
February, 1935	... ...	¾ ,, ,,
February, 1936, to July, 1940	...	½ annual rate applied at 6-monthly intervals.

The applications of green manure at the rate of 1 ton per acre were made in July, 1934, October, 1935, and subsequently at 6-monthly intervals following the application of artificials (with the omission of March, 1937).

The manurial treatments were applied to plots 60 ft. x 60 ft. (*i.e.* 1/12th acre) each containing 25 bushes. The plots were arranged in randomized blocks with six replications. Guard rows were left running longitudinally between the blocks.

The mulching treatment was applied to half-block units after splitting the blocks longitudinally across the plots. The mulching treatment was thus applied to one-half of every plot under manurial treatment and the mulch in no way interfered with the manurial experiment.

The mulch was spread from the side of each plot up to the middle row. Thus there were two rows in each plot fully mulched and two left bare with the middle row mulched on one side and bare on the other. In comparing the yields of mulched and unmulched bushes this middle row was treated as a guard row. The arrangement of the plots is shown in Diagram I.

Pruning and Harvesting.

The bushes were encouraged to grow single stems to a height of 6 ft. by periodic light pruning, removal of suckers and suitable topping. Harvesting was commenced in 1935 and regular fortnightly harvesting has been carried out since as the cherries continue to ripen throughout the year.

Table I.

Yields of Prepared Beans.

(lbs. per acre)

Treatment	1936	1937	1938	1939	Mean
A = NPK ...	227	194	290	595	326
B = NP ...	253	212	263	522	312
C = P ...	234	230	276	605	336
D = P + GM ...	314	242	357	732	411
E = Control ...	214	190	227	430	265

Yields.

The weight of ripe cherry harvested from each plot was recorded in the field. These figures are expressed as prepared bean per acre in Table I. The conversion fraction of 1/10th has been used to obtain the equivalent weight of beans from a given weight of cherry.

The above yields are expressed as percentages of the yields from the control plots in Table II.

Table II.

Yields of Prepared Beans Expressed as Percentage of Control.

Treatment	1936	1937	1938	1939	Mean
A = NPK ...	106	102	127	138	123
B = NP ...	118	111	115	121	117
C = P ...	109	121	121	140	126
D = P + GM ...	146	126	157	170	155
E = Control ...	100	100	100	100	100

Discussion.

The yields during the first three years were very low on all plots, but during 1939 the yield over the whole area was doubled. This general increase can be attributed as is shown below to the mulching treatment which was superimposed upon part of the area.

Among the artificial manures, rock phosphate, applied at the rate of 4 cwts. per acre per annum, has given a substantial increase in yield averaging 26 per cent. over the four-year period. In Treatment B, rock phosphate was applied at half the rate together with sulphate of ammonia at the rate of 2 cwts. per acre. But the increase has averaged only 17 per cent. and very nearly all of this can be attributed to the phosphate, so there has been no appreciable response to the nitrogen. In Treatment A, superphosphate was applied at the rate of 2 cwts. per acre together with 1 cwt. each of sulphate of ammonia and sulphate of potash with a resultant increase in yield of 23 per cent. over the 4-years period.

The best result has been obtained from Treatment D in which green manure dug in at the rate of 2 tons per acre was combined with rock phosphate at the rate of 4 cwts. per acre. The mean increase in yield over the 4 years has been 55 per cent.; about half of this may be attributed to the phosphate and half to the green manure.

Mulching Treatment.

The first application of mulch was made in May, 1938. Bare patches began to appear on the mulched areas after a period of only a few months and it was found necessary to replenish the mulch every 6 months if a cover was to be maintained. The chief material available has been roadside scythings which consist mainly of carpet grass (*Axonopus compressus*). When these supplies have been insufficient other coarser grasses including elephant grass, (*Pennisetum purpureum* and *P. Merkeri*) and *lalang* (*Imperata arundinacea*), and leaves have been used. The mulch has been spread in a layer 3 or 4 ins. deep covering all the ground between and under the bushes. The rate of application has been approximately 10 tons per acre of fresh green material giving an annual application of about 20 tons per acre.

Yields.

The yields of prepared beans from the mulched and unmulched areas are shown in Table III.

Table III.

Yields of Prepared Beans.

(lbs. per acre)

Period	No mulch	Mulched	Percentage Increase
July, 1938 to June, 1939 ...	364	377	4
July, 1939 to June, 1940 ...	376	853	127

Discussion.

The first effect of the mulch was a remarkable increase in the vigour of the bushes. Within 4 months of the initial application the mulched bushes were conspicuous by their healthy appearance. Formerly, many branches were nearly bare and the leaves were small and yellowish; only 4 months later the bushes had become denser, there were many new shoots and the leaves were more numerous, larger and of a healthy green colour. Large increases in yield were anticipated, but reference to Table III will show that the yield during the first 12 months was disappointing. But at the end of the first year the mulched bushes were carrying a heavy crop of fruit and the second year's yields showed an increase of 127 per cent. from 3.3 cwts. to 7.6 cwts. of prepared beans per acre. At the time of writing the mulched bushes show every indication of maintaining and even exceeding this improved yield.

The manner in which the mulch has increased the vigour of the bushes has evidently been mainly by an improvement in the physical texture of the soil. On the unmulched areas the soil becomes baked hard, hot and dry during the dry weather; whereas under the mulch is found a cooler, softer soil, which is always more moist and porous. In times of heavy rain there is considerable surface run-off from the unmulched plots carrying to the silt pits much soil and leaving behind a hard, eroded surface, but on the mulched areas the force of the falling rain is broken by the grass mulch and the rain percolates into the soil with scarcely any run-off. At the same time the humus content of the soil must be increasing as the decaying mulch is gradually incorporated. Under these improved physical conditions the coffee bushes appear to have been able to make a better use of the plant nutrients supplied to the soil. Reference to Table IV below will show the evidence upon which this statement is made. It is seen that for three of the four manurial treatments the increase in yield from those plots receiving both artificial manure and mulch is greater than the sum of the increase from those plots receiving that particular manure alone and mulch alone. As an example Treatment D has given an increase of 131 per cent. Mulch alone has given an increase of 277 per cent. The sum of the two increases is 408 per cent. But the combination of Treatment D together with mulch has given an increase of 480 per cent. *i.e.*, an extra 72 per cent. In addition to its physical value the mulch contains a considerable quantity of plant nutrients. An analysis of roadside scythings composed chiefly of carpet grass has given the following figures:— 0.38 per cent. N, 0.09 per cent. P_2O_5, and 0.36 per cent. K_2O. Thus an application of 20 tons of grass per acre corresponds to one of 170 lbs. N, 40 lbs. P_2O_5, and 160 lbs. K_2O per acre.

An interesting comparison of the relative values of artificial manures and mulch is given by the figures in Table IV. It is seen that a grass mulch alone has increased the yield from 209 to 787 lbs. beans per acre, an increase of nearly 300 per cent. The best manurial treatment on the unmulched plots has given only 509 lbs. beans per acre, so that mulching alone has given a yield 55 per cent. greater than the best of the manurial treatments.

As regards the practicability of mulching it cannot be denied that it is an expensive process, and one impossible to undertake on a large scale where labour is paid. Grass is a very bulky commodity resulting in high costs for carting and spreading and large supplies of grass are seldom available. But there may be occasions when poor areas on an estate can be brought back into production by making use of waste grass and leaves and it should frequently be practicable for small-holders to make use of a mulch. It has been found at Serdang that so long as the mulch is maintained weed growth is almost negligible and a great saving in weeding costs is thus effected.

Table IV.

Yields for the 12-months Period July, 1939, to June, 1940, Arranged to Show the Interaction of Mulch with Manurial Treatments.

Treatment	Yields calculated as lbs. of Prepared Beans per acre.	Yields calculated as Percentages of Unmulched Control
	lbs.	per cent.
Mulched Plots		
D = P + GM ...	1,004	480
A = NPK ...	850	407
B = NP ...	819	392
C = P ...	806	386
E = Control ...	787	377
Unmulched Plots		
A = NPK ...	509	244
D = P + GM ...	482	231
C = P ...	417	200
B = NP ...	260	124
E = Control ...	209	100

On the experimental area the rate of application of the mulch has been high, the quantity being approximately 10 tons per acre of fresh material applied twice a year. It may well be that a smaller application would be more economical though at present there are no data to prove this point. There is, however, evidence to suggest that very good results would follow the application of mulch between alternate rows of bushes, thus reducing the requirement of grass by one-half. On each experimental plot, it will be recalled, there are five rows of bushes, two mulched, two not mulched and a row in the middle half-mulched. The appearance of the half-mulched bushes is almost the same as that of the fully-mulched bushes, and the figures given in Table V shows that the yields have been nearly as good.

Table V.

Yields for 12-months Period July, 1939, to June, 1940, with Varying Degrees of Mulching.

Degree of Mulching	Yields calculated as lbs. Prepared Beans per acre	Percentage Increase compared with Yields from Unmulched Areas.
	lbs.	per cent.
No mulch ...	376	0
Half - mulched ...	757	101
Fully - mulched ...	853	127

Thus it is seen that a half-mulch has given an increase in yield of 101 per cent. whereas the full mulch requiring double the quantity of grass has given only an additional 26 per cent.

If the main value of a mulch lies in its physical properties then other less expensive and more practical means of obtaining the same result might well be tried. The two suggestions which come to mind are (a) cover crops and (b) shade trees. Experiments with leguminous cover crops and shade trees, described in an earlier number of this Journal(3), led to the conclusion that covers have an adverse effect upon the vigour and productivity of the coffee bushes. Trials with shade trees were inconclusive. Where coffee is grown by small-holders it is frequently observed to flourish under shade, but if the shade be dense the bushes become "leggy" and fruit production decreases. An experiment has recently been laid down at Serdang to test the value of light and medium shade.

B. *Coffea robusta* or Robusta Coffee.

A manurial and mulching experiment identical with the one described above has been laid down on an adjacent area of Robusta coffee. The planting distance of this species was 10 ft. x 10 ft. square. Each plot consists of 5 rows of 6 bushes occupying an area of 0.069 acres. The bushes were topped at a height of 5 ft. In other respects treatment has been similar to that of the Liberian species.

Observations on the appearance of the bushes and their yield has led to the conclusion that this variety is unsuited to its environment at Serdang. The mean yield of prepared beans from the control plots during the 4-years period 1936-1939 has been only 247 lbs. per acre, and none of the manurial treatments has given an appreciable increase. This species has, however, responded to the grass mulch though not to such a marked extent as the Liberian species. During the first year after the mulch was applied an increase of 3 per cent. was recorded and during the second year an increase of 59 per cent. During this second year the mean yield of prepared beans from the mulched plots has risen to 457 lbs. per acre but this yield is still too low to be considered economical.*

(Note. In converting fresh cherry into prepared beans the conversion factor of 1/5th has been used).

Summary.

A. *Coffea liberica.*

(1) A brief account of the cultivation of the coffee is given, together with a description of the manurial treatments and experimental lay-out.

(2) The mean yield from the control plots was low at 265 lbs. prepared beans per acre.

* Current prices (January, 1941) in Singapore are: Liberian coffee $15.50; Robusta coffee $9 per picul of 133 1/3 lbs.

(3) The application of rock phosphate at the rate of 4 cwts. per acre per annum gave a mean increase of 26 per cent.
(4) Green manures dug in at the rate of 2 tons per acre per annum together with 4 cwts. of rock phosphate gave a mean increase of 55 per cent.
(5) Small applications of nitrogen and potash in conjunction with phosphate gave no further increases in yield.
(6) The mulching treatment is described.
(7) The health of the bushes showed a noticeable improvement 4 months after the initial application of mulch, but no appreciable increase in yield was recorded during the first 12 months. During the second 12 months, however, an increase in yield of 127 per cent. was obtained. There is every indication that this improved yield will be maintained.
(8) Mulch alone has given a yield 55 per cent. greater than the best of the manurial treatments.

B. *Coffea robusta.*

(1) Robusta coffee has given poor results at Serdang. It has shown no response to manures.
(2) Its response to mulching has been similar to but less marked than that of the Liberian variety. The increase in yield during the second year amounted to 59 per cent.

Acknowledgments.

The writer is one of a succession of officers of this Department, including Mr T. D. Marsh, Mr. J. L. Greig, and Mr. E. J. H. Berwick who have been in charge of this experiment at various times and he acknowledges the share which his predecessors have taken in this investigation. All yield records have been kept throughout by the Malay staff.

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Received for publication 22nd January, 1941.

CONDITIONS ON RUBBER SMALL HOLDINGS IN MALAYA.

4th Quarter, 1940.

Prepared by the Economics Branch of the Department of Agriculture, S.S. and F.M.S., in collaboration with the Field Branch of the Department.

Rainfall.

As usual at this time of the year rainfall was heavy throughout the quarter with the exception of some localities where dry weather was experienced in the second half of December. In Perak South floods of considerable duration occurred at many centres.

In Kelantan rainfall was much below average throughout the quarter owing to the failure of the North-East Monsoon rains.

Prices.

Prices paid during the quarter for small-holding rubber are summarized in Tables I and II. The general range of prices was slightly higher than in the previous quarter.

Uncouponed rubber was sold in Perak North at $18 to $19 per picul, but rose rapidly during the latter part of the quarter to $28. Scrap rubber sold at $7 in the same locality. In Malacca uncouponed rubber sold at $22 to $23, and in Johore North from $18 to $26.50 per picul.

In Perak South the value of coupons fluctuated considerably. After rising to $28.50 per picul equivalent at the end of October they fell to $18 early in December due to the serious interruption of tapping by extensive floods; later, as the weather became drier and tapping increased, they appreciated to $23.

In Selangor in December there was a marked rise in the value of uncouponed rubber in comparison with coupons; the latter ranged from $20.10 to $23.60 while uncouponed rubber ranged from $22.50 to $27.20 per picul.

In Kedah coupon values ranged from $21 to $27.50, and in Kelantan were $26 in October and November, but fell to $23 in December; in Johore North they were $26.50.

Production and Tapping.

Table III shows production of rubber on small holdings by quarters for the year, and it will be seen that there was a considerable fall in the Federated Malay States production in the quarter under review doubtless due to the heavy rains experienced.

Table I.

Lowest and Highest Rubber Prices Paid by Local Rubber Dealers.

(In Malayan dollars per picul of 133 1/3 lbs.)

4th Quarter, 1940.

Quality	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore	Kelantan
				OCTOBER					
Smoked sheet	46.50-48.50	42.00-45.80	42.00-47.50	42.00-47.00	41.00-47.00	46.00-48.50	39.00-47.00	42.00-55.75	40.00-44.00
Unsmoked sheet	44.00-46.50	40.00-44.00	40.00-45.00	40.00-45.00	37.00-45.00	45.50-47.80	39.00-45.80	39.50-46.00	39.00-42.50
Scrap	27.00-31.00	—	30.00-34.00	—	—	32.00-35.00	27.00-31.50	27.00-38.50	28.00-29.00
				NOVEMBER					
Smoked sheet	46.50-48.50	43.00-47.60	45.00-48.30	45.00-51.00	43.50-48.10	46.50-49.40	44.60-48.50	42.40-47.90	42.00-46.75
Unsmoked sheet	45.00-48.00	42.00-45.50	43.50-46.00	42.00-47.00	41.00-46.60	44.50-47.80	41.50-47.50	38.00-46.50	39.00-45.25
Scrap	28.00-31.00	—	30.00-32.00	—	—	33.50-37.40	28.50-35.00	30.20-34.50	26.50-29.00
				DECEMBER					
Smoked sheet	47.00-48.50	41.00-47.20	45.00-49.90	42.50-47.40	42.50-47.50	46.50-48.80	44.00-48.00	43.00-47.50	41.50-46.50
Unsmoked sheet	40.00-47.50	41.00-44.80	43.50-46.20	42.00-45.50	40.00-45.50	44.50-46.50	42.50-46.00	40.70-46.00	39.00-44.00
Scrap	27.00-34.00	—	29.00-31.00	—	—	33.50-36.00	29.00-34.00	26.00-37.00	25.00-29.00

Table II.

Mean of Lowest and Highest Rubber Prices Paid by Local Dealers at a number of Centres in each State.

(In Malayan dollars per picul of 133 1/3 lbs.)

4th Quarter, 1940.

Quality	Penang	Perak	Selangor	Negri Sembilan	Pahang	Malacca	Kedah	Johore	Kelantan
				OCTOBER					
Smoked sheet	47.00-48.00	43.15-45.42	43.53-46.48	43.45-46.68	42.87-45.85	46.83-48.17	42.32-46.10	43.51-46.65	41.25-44.25
Unsmoked sheet	44.75-46.12	41.34-43.38	40.75-43.75	41.20-44.43	39.25-43.88	46.53-46.93	40.52-44.30	41.69-44.18	39.75-42.25
Scrap	28.33-29.67	—	30.00-34.00	—	—	32.17-34.50	28.17-30.83	29.55-32.27	28.00-29.00
				NOVEMBER					
Smoked sheet	46.75-48.00	44.90-46.45	45.77-47.47	45.93-48.58	45.03-47.43	47.92-48.57	45.15-47.30	44.57-46.62	42.88-45.12
Unsmoked sheet	45.50-47.25	43.18-44.58	44.00-45.75	42.18-45.72	42.75-45.40	46.27-46.93	43.15-45.88	42.46-45.03	40.62-43.12
Scrap	29.33-30.33	—	30.00-32.00	—	—	34.17-35.47	29.83-34.00	30.67-33.57	27.25-28.00
				DECEMBER					
Smoked sheet	47.25-48.50	44.29-45.78	45.85-47.92	43.98-47.03	44.00-46.64	47.70-48.32	44.88-47.03	45.02-46.43	43.25-44.75
Unsmoked sheet	44.88-47.12	42.56-43.93	43.60-45.85	42.60-44.43	41.88-44.81	45.33-45.92	43.25-45.50	42.74-44.73	40.00-43.00
Scrap	29.67-31.33	—	29.00-31.00	—	—	34.33-35.17	30.00-33.17	30.00-32.08	25.50-28.50

Table III.

Production of Rubber on Small Holdings.

(in tons)

	Total 1939	1st Quarter 1940	2nd Quarter 1940	3rd Quarter 1940	4th Quarter 1940	Total 1940
Federated Malay States ...	51,769	22,637	28,553	28,062	23,734	102,986
Straits Settlements ...	9,950	3,781	3,931	3,867	4,115	15,694
Unfederated Malay States ...	54,850	21,973	26,881	24,254	23,131	96,239
TOTAL MALAYA ...	116,569	48,391	59,365	56,183	50,980	214,919

The results of the quarterly survey of small holdings are summarized in Tables IV and V. There was a further increase in tapping, probably due to the increased coupon allowance and to the fact that little tapping could be done in the first two months of the quarter owing to weather conditions. The high price paid for uncouponed rubber was also doubtless an additional reason for increased tapping.

Quality of Rubber and General Conditions on Holdings.

"Wintering" commenced on some holdings in Perak towards the end of December.

In Pahang interest in the use of cover crops and in measures against soil erosion is reported to be maintained, and Asiatic Rubber Instructors have again assisted in obtaining seeds and fertilizers for small-holders.

The Malacca report states that the majority of holdings are in poor bark condition but genuine attempts to improve the tapping system have been shown in quite a number of holdings. Tapping was particularly excessive on holdings leased to tappers on the *"bagi dua"* system whereby the proceeds are divided between the owner and the tapper and this system is being discouraged wherever possible by the Asiatic Rubber Instructor. Sheet produced was generally of good average quality, smoking being done by Chinese dealers who own smoke houses.

In Selangor there are now 12 smoke cabinets in existence, all of which were in regular operation during the quarter.

Several reports were received in Johore of excessive tapping on holdings in attempts to extract as much latex as possible. In the Segamat District of Johore Chinese small-holders have, with the assistance of the Asiatic Rubber Instructor,

Table IV.

Estimated Acreage of Tappable Rubber which was out of Tapping on Holdings of less than 100 Acres at the end of December, 1940.

PERAK				SELANGOR				NEGRI SEMBILAN				PAHANG			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Batang Padang	36,187	4,700	13	Klang	16,143	5,200	32	Seremban	23,639	15,600	66	Raub	10,534	4,200	40
Kinta	38,874	7,400	19	Kuala Langat	23,881	4,100	17	Tampin	21,896	7,000	32	Kuala Lipis	15,457	1,400	9
Kuala Kangsar	92,166	6,500	7	Ulu Langat	45,012	6,300	14	Kuala Pilah	31,832	14,600	46	Bentong	12,224	1,300	11
Upper Perak	15,590	1,100	7	Ulu Selangor	31,463	6,600	21	Jelebu	9,097	900	10	Other Districts†	46,373	8,300	18
Larut & Selama	43,132	nil	nil	Kuala Lumpur	20,277	4,500	22	Port Dickson	11,133	5,600	50				
Krian	9,408	7,800	83	Kuala Selangor†	8,417	1,700	20								
Lower Perak	26,735	7,800	29												
Dindings	9,873	2,900	29												
	271,965	38,200	14		145,193	28,400	20		97,597	43,700	45		84,588	15,200	18

MALACCA				PENANG & P. WELLESLEY				SINGAPORE			
District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage	District	Total Tappable area	Total area untapped	Percentage
Central	14,093	3,200	23	North	3,549	1,000	29	Singapore	20,115	400	2
Alor Gajah	30,838	8,600	28	Central	10,785	3,100	29				
Jasin	25,286	5,600	22	South	8,936	1,300	14				
				Penang	15,822	500	3				
	70,217	17,400	25		39,092	5,900	15		20,115	400	2

JOHORE	350,007	28,000	8
KEDAH	102,126	8,200	8
KELANTAN	49,133	11,300	23
PERLIS	2,916	5,200	16
TRENGGANU ‡	29,836		

The percentage of areas out of tapping in September, 1940, was as follows:—Perak 16, Selangor 21, Negri Sembilan 46, Pahang 24, Malacca 29, Penang and Province Wellesley 37, Singapore 2, Johore 7, Kedah 11, Kelantan 20.

†Estimated from percentage for other Districts in the State.

‡Estimated from percentage for rest of Malaya.

Table V.

Comparisons of Areas of Rubber Small Holdings Out of Tapping

	December, 1939		September, 1940		December, 1940	
	Acres	Percentage	Acres	Percentage	Acres	Percentage
F.M.S. ...	184,400	30.7	139,000	23.0	125,500	21.0
S.S. ...	25,800	20.0	35,400	27.4	23,700	18.3
U.M.S. ...	58,300	10.9	47,400	8.8	52,700	9.9
Malaya ...	268,500	21.0	221,800	17.6	201,900	16.0

erected since last July 15 smoke houses. These resemble a smoke cabinet in construction but are larger, having a capacity of 12 to 15 piculs.

More smoke houses have been erected in Kelantan, the latest figures being as follows:—completed 117 (106), under construction 23 (24), projected 44 (41). The figures in brackets are as at the end of the 3rd quarter.

In Pahang there is now only limited interest in the erection of smoke houses, new erections balancing abandoned cabinets which have fallen into disrepair; others are maintained but not regularly used. It is considered that the Pahang Grading Scheme is not achieving its purpose.

Planting and Budgrafting.

Most reports mention the increasing interest which is now being taken in replanting and in budgrafting replanted areas. In the past there has often been the fear that controlled production may cease and that there would be no coupons to carry over until the replanted areas come into bearing.

Large quantities of budwood have been supplied through the Department either from Agricultural Stations or from estates and large orders are being booked for 1941. In Negri Sembilan, for example, Malay small-holders have already asked for some 2,000 yards to be supplied between March and November.

The Selangor report states that there is still a tendency to take risks by planting budded stumps in the field as opposed to seedlings for budding. Clonal seed is also in favour in some areas.

The Pahang report states that the acreage involved in replanting is not spectacular, approximately 1,100 acres, but the trend to replant is undoubtedly slowly gaining impetus. In Temerloh, propaganda was hampered by irresponsible Chinese tappers spreading the belief among Malay small-holders that budded trees give no better return than seedling stands. Parties were organized to visit a local estate in order to demonstrate the fallacy of this statement. There is no difficulty in

obtaining budders at reasonable rates, and the Malays often bud their seedlings themselves. The report adds that catch-cropping is popular, more specially with the Chinese; patchouli is a favourite crop in some areas.

The Perak South report states that it is still difficult to get more than a few Malay small-holders interested in replanting, and lectures to about 150 Malays were given on this subject at Kota Bharu, Kinta. An immediate result was that 11 small-holders from this locality applied to replant. The Agricultural Assistant, Kinta, also gave a talk on the same subject at a meeting of the Chemor Adult School.

Pests and Diseases.

With the heavy rains experienced during the quarter there was the usual recrudescence of mouldy rot, but reports indicate that control measures were carried out satisfactorily everywhere.

In Johore North further progress is reported with the establishing of ground covers on areas where new planting and replanting have been undertaken.

There are large areas in Lower Perak which are liable to periodic flooding, and most of the trees are severely infected with root disease. The report suggests that where these lots, as frequently occurs, are adjacent to padi land it would be sound practice to change over from rubber cultivation to padi planting.

In Temerloh, Pahang, monkeys were a nuisance by damaging budded seedlings, and were controlled by shooting.

Demonstrations on the control of root disease were given by Asiatic Rubber Instructors at various centres in Selangor.

General.

The Asiatic Rubber Instructor, Tanjong Malim, Perak, has made popular a locally-made, non-folding budding knife. The blade is made by a blacksmith for 15 to 20 cents and the handle is made by the small-holder from hardwood or buffalo-horn. The cost of a ready-made budding knife is about $2.

The Malay Instructor, Ulu Langat, Selangor, has initiated courses in tapping, manufacture, and budgrafting for unemployed Malay youths. This has been done in conjunction with the Co-operative Marketing Officer, and the object is to draft the youths either into estate employment or to replace Chinese tappers on Malay-owned small holdings

A temporary shortage of coagulants is mentioned in some reports. The Department of Agriculture continues to supply acetic acid in some localities. Sulphuric acid and alum are still being fairly extensively used in Kedah, especially in areas remote from a licensed vendor of acetic acid.

A Johore report states that various brands of coagulants being offered for sale at different centres were tested by the Asiatic Rubber Instructors, and a large proportion were found to contain hydrochloric or sulphuric acid. The import of these acids and of coagulants containing these acids is now prohibited so that they will gradually disappear from the market, but in the meantime the Asiatic Rubber Instructors are in a position to advise small-holders which brands should be avoided.

QUARTERLY REPORT ON THE MALAYAN PINEAPPLE CANNING INDUSTRY.

September to November, 1940.

Prepared by the Economics Branch of the Department of Agriculture, S.S. and F.M.S., from Reports of Field Officers.

Factories.

There are 20 registered factories in Malaya, four of which are peeling sheds. This total is made up as follows: Singapore 5, of which one is canning juice; Johore 9 factories and 3 peeling sheds; Selangor 3, of which one is a peeling shed.

In Singapore, two factories were working for about 2 days a week during September. Early in October only one factory was working. In November the four fruit canning factories were working at half-pressure, working for about 5 days a week and producing about 700 cases per day each.

In Johore owing to lack of fruit supplies all factories were closed until mid-November when three commenced operating; they were still working at the end of the quarter under review.

In Selangor one factory and one cutting shed commenced working on 1st December.

Prices.

There was no change in the prices of canned pineapples sold on the open market, which were nominal and quoted in the last report. Special prices were arranged, however, for sales to the United Kingdom through the Ministry of Food and to the British military authorities, a reduction of 13.4 per cent. being made, effective from the 1st October 1940, on the official price list of the Board. Later, prices were again revised and increased by 5 cents per case in respect of a further 252,000 cases sold to the Ministry of Food, it being understood that the pack should be of a higher average quality than G. A. Q. (to include an average proportion of 20 per cent. of golden fruit in each can and in no case less than 10 per cent.). These prices, *ex* store, unlabelled, were as follows:—

				$
1	lb.	Tall Cubes	(72)	5.65
1½	,,	Flat Cubes	(48)	4.25
1½	,,	Sliced Flat	(48)	4.20
2	,,	Tall Cubes	(36)	4.15
2	,,	Sliced Tall	(36)	4.10

Fresh fruit prices were revised in October, and again on 15th November when the following scale came into operation:

Class of Fruit	Average Weight of 100 Fruit	Price for every 100 Fruit less than Half Ripe			Premium for every 100 Fruit at least Half-Ripe
		Johore and Klang	Singapore		
			Kranji	Serangoon and Grove Road	
	lbs.	$	$	$	cents
1½ lbs. to 2½ lbs. ...	200	.66	.77	.83	nil
2½ lbs. to 3½ lbs. ...	300	1.00	1.17	1.25	nil
Over 3½ lbs. ...	400	1.34	1.56	1.67	nil

It would appear that prices in the field bear a reasonable relation to those paid at factories, but growers affirm that present prices are not economic.

Production and Sales.

The Ministry of Food made two purchases of Malayan canned pineapples during the period under review, the first for 361,321 cases, and the second for 252,000 cases.

Exports of Malayan canned pineapples for the three months subsequent to the last quarterly report were as follows:—August 816 tons, September 454 tons, October 749 tons. November exports were 1,793 tons.

The Central Board fixed the packing quota for the season October, 1940, to March, 1941, at 800,000 cases, with the proviso that packing should cease if the unsold stock reached 200,000 cases. Of the total quota a release of 400,000 cases was made. Of the release of 400,000 cases, 300,000 were appropriated for packing of United Kingdom grades and sizes, the balance of 100,000 cases to meet the demand from other markets.

Government Research Station and Canning Factory.

It is probable that there will be a considerable surplus of fresh pineapples during the next big season and various means of utilizing this fruit have been considered, the most promising of which is the production of pineapple juice and jam. Much experimental work has been carried out in the past on canning the local pineapple juice and the information is available to the packers, but only preliminary canning trials had so far been carried out on pineapple jam. More detailed experiments have therefore been undertaken and many trial batches of jam made. In order to produce a satisfactory jam it has been found necessary to add some pulpy material containing pectin to the pineapple, as pineapple is deficient in both pectin and pulpy matter. Either papaya or pumpkin has been found to satisfy these requirements very well and some attractive samples of jam have been produced. Small quantities of lime-juice, citric acid or mashed ginger root have been added,

to enhance the flavour, with satisfactory results. It is felt that this jam should find a ready market in the United Kingdom, provided shipping space is available, and in the Middle East, as the cost of production is comparatively low and the jam could probably be sold at competitive prices compared with other jams.

About one half of the local pineapple factories will probably not be in production for the duration of the war and consideration has been given to find other products for them to can in order to enable them to contribute towards the war effort. Many canning trials have been carried out on local vegetables, meat and vegetable ration, and canned chickens. The results obtained in several cases have been good and samples submitted to the Military Controller of Supply and Transport have received favourable comment.

Two sample consignments of canned pineapples were packed for the United States. The sample packs consisted of carefully sorted fruit, Golden and Standard colour grades being mixed together in the proportion of 40 and 60 per cent. respectively, the cans being exhausted and sealed with rubber compound joints in place of the usual rubber rings, thus eliminating all the causes of complaints previously received from America on the local canned pines.

Estimates of the cost of production of all the sizes and grades of Malayan canned pineapples were worked out in order that Government might be in a better position to judge the conditions of the markets and the profits or losses being made by the packers.

Selected Article.

AGRICULTURAL POLICY IN THE COLONIAL EMPIRE *

There are very wide differences in the standards of life in the different parts of the Colonial Empire. In some, such as the Mediterranean Colonies, the conditions and standards of living approximate more or less to those of Europe. In others, there has for long existed an ancient culture and civilisation, but over a great deal of the Colonial Empire, including the greater part of the British possessions in tropical Africa, utterly primitive conditions prevailed less than two generations ago. It would be entirely unreasonable to expect that within this short period of time anything approximating to European standards should have been introduced. The important thing is that there should be an improvement in conditions that is continuous and as rapid as circumstances permit.

H.M. Government have been anxious that the war should cause the minimum interruption in this process of improvement. Within a few days of the outbreak of war Colonial Governments were informed that it was the Secretary of State's hope that social services would continue as far as possible unaffected, and that there would be no retrenchment of personnel.

Progress in the Colonial Empire must, of course, have an economic foundation. As the recent Statement of Policy on Colonial Development and Welfare showed, few of the Colonies possess substantial mineral wealth or manufacturing industries of any magnitude. Copper from Northern Rhodesia, tin from Malaya, and to a less degree from Nigeria, gold principally from the Gold Coast, diamonds and iron ore from Sierra Leone, and oil from Trinidad are the chief mineral products. These minerals are most valuable to the Empire in war-time and bring substantial advantages to the Colony itself, together with certain disadvantages; but for the most part agriculture (including animal husbandry) is the principal, if not the sole source of wealth. Progress on the agricultural side is therefore almost the first requisite for progress in any other direction.

The foundations of the present agricultural policy were worked out by Committees presided over by Lord Milner and Lord Lovat in the decade following the war. The following are extracts from their reports:—

> The money needed to finance measures for the benefit of the native inhabitants in connection with education or buying is in the main derived from wealth produced by agriculture.
>
> On the efficiency of agriculture depends not only the food supply of the population, but indeed all economic and social progress.
>
> Science does not stand still, and the country which lags behind in the application of the latest scientific knowledge to the practice of agriculture must suffer a loss which cannot be estimated.

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* *The Crown Colonist*, December, 1940.

As a result of the work of these Committees, the post of Agricultural Adviser to the Secretary of State was created, and the Colonial Advisory Council of Agriculture and Animal Health was appointed, charged with advising on the recruitment and training of officers for the Colonial Agricultural Service, the efficiency and general well-being of the Service, the collection, collation and distribution of agricultural information, and the development and general supervision of agricultural research institutes, stations and projects.

Technical Training.

A Colonial Agricultural Scholarship Scheme for post-graduate training of agricultural officers at Cambridge and the Imperial College of Tropical Agriculture, Trinidad, was also started. This has fully justified itself and the standard of work of Colonial Agricultural Departments has been completely transformed during the past ten years. It is admitted from all quarters that the Colonial Agricultural Service has already reached a standard of work which is high. This is particularly the case in regard to field investigational work, executive duties, extension work and development. Greater progress is still to be desired in agricultural research and in regard to agricultural education. A wider development of the utilisation of livestock in agriculture is necessary in the interests of soil conservation, the maintenance of soil fertility and the improvement of nutrition. This is particularly the case in the West Indies, where the development of mixed husbandry is very desirable. Progress has already been made in Nigeria, and the development which has taken place recently in Tanganyika in the use of cattle manures has been most marked.

The rapid spread of soil erosion in many parts of East Africa and elsewhere has driven in the point that the aim of agricultural policy must be to see that soil resources are used to maintain the hightest possible standard of living. Land in many places has been abused and Nature has revolted. In such cases complete reorientation of viewpoint in regard to Colonial development may be necessary. Better and more intensive systems of agriculture must be evolved and developed. Investigational work has already begun, and better agricultural methods are now being adopted in most of the East African Dependencies. A quickening of the pace is necessary if many parts of these territories are to be saved from desolation. In Basutoland, on the slopes of Kilimanjaro in Tanganyika, and in the Central and Nyanza Provinces of Kenya, examples of the improved treatment of land are now to be seen. These efforts need to be extended and to be introduced into other areas of the Colonial Empire.

Social progress is dependent, in the greater part of the Colonial Empire, upon agricultural prosperity. Where agriculture has been generally prosperous, as in Malaya, the Gold Coast and Uganda, progressive development of communications, health and education has been possible. Where wealth from agriculture has been limited, as in some of the poorer and smaller Dependencies, social progress and education have lagged behind. In African territories can be found hard-working

tribes with a developed agriculture and others who produce little or nothing of economic value. An elaborate comparision of their relative standards of living, health and social habits is unnecessary. The differences can be seen by anyone during the most cursory visit.

But, in many areas, too much emphasis has been given to the improvement and development of crops for export. This must be changed. Food supplies must be given greater consideration and a balanced agriculture evolved.

This has been stressed by the Colonial Advisory Council of Agriculture and Animal Health, and the Secretary of State has asked that each Dependency should frame a clear agricultural policy. The value of this can be seen in Sierra Leone, where a definite policy for agriculture was officially determined in 1936 and is already bearing fruit. This policy covers the production of adequate food for the people and the development of rice in the swamps, the proper cultivation of export crops, the arresting of de-forestation of the high lands, and improvement in the preparation and marketing of produce.

Food supplies should clearly receive first consideration, for good food is the first essential for good health and happiness. Many Colonies do not depend on imports of food, but very often their own production does not really suffice for good nutrition. In the case of those Colonies which do depend on imports, such as many of the West Indian islands and Ceylon, increased local production is particularly desirable in war-time. Good progress is being made in a number of Colonies.

Research provision has been made on a crop basis. During the past 15 to 20 years provision has been made for rubber, sisal, tea, coconuts, sugar, cotton, coffee, cacao, and bananas, in many instances with assistance from associations of producers. Rubber planters now have plant material which is capable of yields four to five times those of the earlier mixed plantations, and sugar yields have in many areas been increased by 25 per cent. Some pests and diseases have been overcome, soil investigations carried out and physiological investigations made. Of course, much remains to be done.

The new money, when it can be made available, should make it possible to effect considerable advances in agricultural methods and agricultural research.

Notes and Comments.

HOW TO COOK MALAYAN VEGETABLES.

The Department of Information and Publicity has recently published a fully illustrated booklet on "How to Cook Malayan Vegetables." The object of this compilation of recipes is to make Malayan residents more familiar with the wide range of vegetables grown in this country and to show that all the common vegetables of Malaya are worth trying, while some of the cheaper vegetables will be found to be just as good as those which are highly priced and more in demand.

The Introduction states:— "This miniature cookery book is complementary to the pamphlet entitled "Grow Your Own Food" which was published recently to assist householders in Malaya to lessen their dependence on imported food supplies and grow more vegetables in their own gardens. It was found that many European housewives were unfamiliar with the Malayan vegetables mentioned in that pamphlet and did not know how to prepare and serve them. Consequently, this little book has been published. It is hoped that many of the recipes and hints will be useful to housewives of the domiciled Malayan communities as well."

The author, Mrs. Ursula Holttum, has presented her facts with clarity and the arrangement of the booklet is good. It should be in considerable demand amongst Europeans, whose ignorance on Malayan vegetables and methods of cooking them is usually abysmal, but its usefulness to domiciled communities from Asiatic countries will we think be very restricted, for Asiatic housewives are familiar with all local vegetables while their methods of preparing such vegetables are more in conformity to Eastern tastes than those recommended by the author.

FOOD PRODUCTION COMMITTEE IN THE FEDERATED MALAY STATES.

His Excellency the High Commissioner has appointed a Committee in the Federated Malay States with the following terms of reference:—

"To consider and make recommendations regarding the possibility of increasing, under present conditions of war, the local supply of foodstuffs."

The members of the Committee are:— The Hon'ble Mr. J. V. Cowgill, M.C., M.C.S. (Chairman), the Hon'ble Mr. Yong Shook Lin, J.P., M.F.C., Messrs. F. Birkinshaw, C. R. Thurstan, J.P., D. Farquharson, C. S. Kneebone and R. G. Heath. Mr. Heath, in addition to being a member of the Committee, is carrying out the duties of Secretary.

CENTRIFUGING FRUIT JUICES.

During recent years the development of the centrifuge has greatly simplified the preparation of fruit juices, states *Food Manufacture* of October 4th, 1940. The principle upon which the machine is designed makes it specially suitable for processing edible materials and it is now in wide use in food industry.

The centrifuge is used in the production of concentrated juice to remove suspended colloidal matter, sediments and wild yeasts from the freshly pressed fruit and also to control the pectin content. If too much pectin is present in the juice it will solidify when concentrated, but it has been shown that if pectin compounds are removed by the use of an enzyme the juice can be concentrated without gel formation. It is most important to produce clear products, and hence the juice must be clarified before concentration. It is claimed that the only satisfactory method of doing this is to clarify the juice centrifugally, as the types of solids tend to lower the efficiency of other methods.

COCONUT CAKE AS TRAIN FUEL.

According to the *Ceylon News* of January 20th, 1941, the results of experiments carried out so far to explore the possibilities of running trains with coconut cake (poonac) as fuel are said to be not quite satisfactory.

Economically, the use of coconut poonac for this purpose is considered inadvisable as very large quantities would have to be used on each engine and, in comparison with coal, the cost would be prohibitive.

The steaming properties of the poonac are also considered unsatisfactory as it takes a long time to generate the necessary heat and it is not sustained for a sufficiently long time.

Another drawback that has been brought to light is that if the poonac is to be used in the engines it must be made into large blocks, capable of easy transport. Such blocks, it is stated, could then be stacked on the tenders like coal and easily handled by the firemen.

Although the experiments have not yielded promising results, the investigations are being continued in the hope that it may be possible to obtain better results by making certain chemical additions to the poonac.

VERNACULAR PUBLICATIONS.

The Department of Agriculture continues to publish quarterly journals in Malay, Chinese and Tamil in which the research work of the Department is presented to local agriculturists of these nationalities and particularly to the small-holders. Naturally, recent numbers have emphasized the importance of food production and editorials in the journals have shown how the small-holder can further the war effort by growing more of the food required by his household. Recent numbers of the journals have contained articles on improved varieties of padi, poultry and ducks, soil erosion, sweet potatoes, replanting of rubber, agriculture and co-operation, cover crops, while the Chinese and Tamil journals have also included articles on pig keeping. Other articles on food production were published in previous numbers, which are still available for distribution.

These vernacular publications are issued free, and post free, in the Straits Settlements and Federated Malay States, and at 15 cents a copy post free outside this area. The Governments of the Unfederated Malay States, however, distribute a number of free copies to agriculturists who are likely to make good use of them.

Employers of labour are invited to co-operate with the Department by applying for copies of the journals for the use of their labour force. Applications to be placed on our mailing list should be addressed to the Agricultural Economist, Department of Agriculture, Kuala Lumpur.

QUIT RENTS ON COCONUT AND OIL PALM LANDS.

During the four years 1937 to 1940 the Federated Malay States Governments granted concessions in the matter of payment of rent on coconut and oil palm lands in view of the depressed state of the markets for the products of these two industries. The Governments state that they are not prepared to extend the concessions on oil palm lands in respect of the year 1941. The concessions will, however, apply in 1941 for coconut lands. In this case the concessions are as follows:—

In the case of lands exceeding 10 acres in area—

(a) the rent on planted areas already enjoying a rebate for land cultivated with coconuts under the Land Rules and paying $2 an acre will be reduced to $1 per acre:

(b) unplanted areas will also pay $1 per acre only.

In case of lands not exceeding 10 acres in area, the effect of the concession, will be to reduce the rent, which is in the majority of cases less than $2 per acre, by half.

Application for the concession should be made to the Collector of Land Revenue of the District in which the land is situated. The question of eligibility of applicants for the concession is a matter for the discretion of the State authorities.

Departmental.

FROM THE DISTRICTS.

Compiled in the Office of the Chief Field Officer from Monthly Reports of Agricultural Officers.

January, 1941.

The Weather.

In north Kedah and also in Kelantan the weather has been dry. In other parts of the country rain has been frequent and the total precipitation in most places approximates to normal.

Crop Reports.

Rubber.—The price of rubber has been lower, smoked sheet fetching between $41 and $46 per picul. In some places the value of coupons also decreased considerably; this has been attributed to the high release of export rights and the wet weather which has held up tapping.

In Johore it is reported that coagulants containing sulphuric acid are still on the market although importation of sulphuric acid into the State has been prohibited for some months.

Padi.—In north Kedah harvesting is in full swing. Heavy showers during the latter half of the month caused some inconvenience to harvesters, but benefited late-planted areas which were in danger of succumbing to drought. Shortage of labour has been felt very severely; 350 men from Province Wellesley and Kuala Muda came in to help with the reaping but this did not go far to compensate for the absence of the labourers from Patani and considerable difficulty in getting the crop reaped is still being experienced. Harvesters usually receive a part of the crop in payment for their services: this season payment by the day has become more common than previously.

In Krian harvesting has just started. In Perak Central hill padi is reported to have done unusually well: in certain instances crops of from 400 to 450 gantangs per acre have been obtained. In the Sungei Manik area harvesting is just commencing; prospects are very varied as high winds have caused lodging and deep areas have suffered from an excess of water. In Stage IV much of the surviving padi will give only a very poor crop as flowering has been delayed by excessive water.

In Kuala Selangor the crop is making fair growth. At Panchang Bedena and Sungei Panjang much of the crop has reached the flowering stage and water is now being withdrawn. The crop looks good and prospects are promising. Areas not planted to schedule have not made such good progress. In places rat damage has been severe.

Rats have taken a heavy toll of the crop in Pahang and in consequence the yield is lower than usual. There is likely to be little padi surplus to the cultivators' requirements and in fact up to the present no padi has been offered to the Government rice mill.

In Malacca the seed farms which have been organized on a much bigger scale during this season have in most cases done very well and have served as useful demonstration centres. At present there are 500 of these farms. It is hoped that in the 1941-42 season this organization for seed distribution will be completed and it should be possible to supply all rice land in the Settlement with seed from such farms. One thousand seed farms should be in operation by that time. Seed is distributed from these farms by exchanging the pure strain seed with padi brought in by cultivators in the locality. Cultivators are coming to appreciate this service.

In Kelantan the dry padi crop is a good one in almost all localities. In one area which has only recently been brought into cultivation crops of as much as 600 gantangs per acre have been harvested. Generally, crop prospects in this State are quite promising and the total yield is likely to be the same if not higher than last year.

Coconuts.—Prices have remained at the same low levels. Nevertheless on the approach of Chinese New Year there was some activity on Chinese-owned holdings.

Statistical.

MARKET PRICES.

January, 1941.

Major Crops.

Rubber.—There was a sharp fall in the Singapore market during January. No. 1. X. Ribbed Smoked Sheet opened at 37¾ cents per lb. but weakened steadily to 35⅞ cents on the 22nd January, later recovering to close at 36⅞ cents.

The average of daily quotations for the month was 37.07 cents per lb., as compared with 38.35 cents in December. The London average price was 12.40 pence per lb., and New York 19.75 cents gold, as compared with 11.93 and 20.65 cents gold in December.

Prices paid for small-holders' rubber at three centres during the month are given in Table 1.

Table I.

Weekly Prices Paid by Local Dealers for Small-Holders' Rubber, January, 1941.

(Dollars per picul of 133 1/3 lbs.)

Grades	Kuala Kangsar, Perak					Kuala Pilah, Negri Sembilan					Batu Pahat, Johore.		
	1	8	15	22	29	2	9	16	23	30	8	15	22
Smoked Sheet ...	45.50	45.00	45.00	44.00	41.60	—	45.65	45.00	42.50	43.20	45.00	43.13	41.02
Unsmoked Sheet ...	42.86	42.90	42.00	42.00	—	44.00	—	—	—	—	43.00	42.20	39.04
Scrap ...	—	—	—	—	—	—	—	—	—	—	—	—	—

Transport by F.M.S.R. lorry service Kuala Pilah to Seremban 12 cents per picul, to Malacca excluding duty, 25 cents per picul, by rail Seremban to Penang $1.24 per picul, Seremban to Singapore $8 per ton.

Transport from Batu Pahat to Singapore by lorry, excluding duty, 90 cents per picul.

Transport from Kuala Kangsar to Prai by railway $6.20 per ton.

At Kuala Pilah the standard deduction for moisture in unsmoked sheet is 5 per cent.

No purchases of rubber at Batu Pahat on the 1st and 29th January.

Table II.

Singapore Price of Various Agricultural Products.

Product	January, 1941			Dec. 1940	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Copra :					
Sundried ...	2.40	2.40	2.40	2.40	3.08
Mixed ...	2.15	2.15	2.15	2.15	2.76
Coconut Oil ...	—	—	7.00	7.00	8.29
Copra Cake ...	2.00	2.00	2.00	2.00	1.43
Pineapples, Canned :*					
G.A.Q. : Cubes ...	4.85	4.85	4.85	4.85	4.85
Sliced ...	4.80	4.80	4.80	4.80	4.80
Tall ...	4.95	4.95	4.95	4.95	4.95
Golden : Cubes ...	5.45	5.45	5.45	5.45	5.45
Sliced ...	5.40	5.40	5.40	5.40	5.40
Tall ...	5.55	5.55	5.55	5.55	5.55
Coffee :					
Liberian ...	15.50	15.50	15.50	15.12	16.10
Excelsa ...	12.00	12.00	12.00	11.50	13.69
Robusta ...	9.00	8.50	8.83	8.00	8.92
Palembang ...	16.25	14.00	14.15—16.15	13.25—15.88	13.00†
Sourabaya ...	18.25	16.00	16.10—18.10	15.81—17.81	14.80†
Arecanuts :					
Best ...	6.00	5.70	5.86	6.23	5.65
Medium ...	5.50	5.00	5.31	5.90	5.24
Mixed ...	5.25	4.50	4.94	5.46	4.88
Splits ...	7.50	5.25	5.50— 7.15	5.06— 7.06	6.33†
Red Whole ...	8.50	6.00	6.30— 8.35	4.56— 6.75	6.67†
Sliced ...	11.25	8.00	8.25—11.05	9.06—11.38	10.79†
Pepper :					
Singapore Black ...	7.00	6.25	6.69	6.25	7.29
Singapore White ...	13.50	13.25	13.38	‡	‡
Muntok White ...	14.00	13.25	13.69	13.25	13.51
Nutmegs :					
110's ...	22.00	20.00	21.00	24.75	26.11
80's ...	24.00	22.00	23.00	26.00	30.65
Penang, dried¶ ...	—	—	16.00	14.00	21.00
Mace :					
Siouw ...	‡	‡	‡	‡	‡
Amboina ...	37.00	37.00	37.00	‡	39.85
Penang, dried¶ ...	—	—	40.00	40.00	63.50
Cloves :					
Zanzibar ...	41.00	40.00	40.67	‡	‡
Amboina ...	43.00	42.00	42.67	‡	‡
Penang, dried¶ ...	—	—	50.00	55.00	72.00

* per case of 48 cans of 1½ lbs. each. † Highest of the average monthly range quotations.

¶ Penang prices. ‡ Not quoted.

Product	January, 1941			Dec. 1940	Average Price 1940
	Highest	Lowest	Average	Average	
	per picul $	per picul $	per picul $	per picul $	per picul $
Gambier:					
Block ...	‡	‡	‡	‡	‡
No. 1 Cube ...	14.50	12.75	13.44	14.50	15.00
Sago:					
Pearl ...	7.50	7.35	7.40	7.94	7.79
Flour, Sarawak Fair ...	4.40	4.35	4.38	4.50	4.95
Tapioca:					
Flake Fair ...	6.50	6.25	6.31	6.50	8.08
Seed Pearl ...	7.40	7.25	7.36	7.25	9.45
Medium Pearl ...	8.00	7.35	7.55	8.00	9.07

Palm Oil.—No recent information is available regarding prices paid for Malayan oil in the United Kingdom.

Local sales of palm oil in sellers' drums were made during January at the following prices:— unbleached oil 6 per cent. f.f.a. $110 per ton f.o.b. Port Swettenham, $123 f.o.b. Singapore; 5 per cent. f.f.a. $147.50 per ton c.i.f. Colombo.

Tea.—There are no London tea sales.

The latest Colombo prices available, quoted from *The Ceylon Tea Market* Report of 14th January, 1941, of the Colombo Brokers' Association are as follows, in rupee cents per lb.: High Grown Rs. 1.06, Medium Grown 89, Low Grown 82.

Cardamoms.—Green cardamoms were quoted in *The Ceylon Chamber of Commerce Weekly Report* of 13th January, 1941, from Rs. 1.72 to Rs. 1.88 per lb.

Rice.—The November average retail prices in cents per gantang (gallon) of No. 2 Thailand rice were: Singapore 38, Penang 36, as compared with 36 and 36 respectively in October. Malacca is not quoted.

The average declared trade value of imports during November was $5.47 per picul, as compared with $5.48 in October and $5.04 in September.

Padi.—The Government Rice Mills, Perak, are paying a guaranteed price of $2.50 per picul for padi, plus a bonus of 10 cents per picul for pure strain S.K. 48 padi. There were no purchases of padi at the Government Rice Mill, Temerloh, Pahang.

Retail prices of padi in cents per gantang (gallon) were as follows:— Kedah 9½, Perak 12 to 18, Pahang 12 to 24, Malacca 22 to 24, Kelantan 12 to 12½.

Derris.—Prices during January were subject to rather irregular fluctuations. Renewed demand, mainly from the United Kingdom, caused quotations to rise temporarily, but derris not being classed under priority cargo, the consequent shipping difficulties appear to have curtailed actual sales to negligible quantities. Freight space to New York was also not easily available and it would appear that

practically none of the enquiries for shipment at the old rate of freight before 1st March were allowed to materialize. The influence of Chinese New Year contributed a good deal towards a market with roots of medium quality (5 to 6 per cent. rotenone) freely available at, if not below, prices of the previous month, with a tendency to weaken. Prices per picul averaged $9.50 to $11 for roots sold on a basis of ether extract, and $18 to $22.50 for roots with 4 to 5 per cent. rotenone content, rising to $27 to $28.50 for 7 to 9 per cent. rotenone.

Tobacco.—Prices of prepared tobacco per picul in Kelantan were lower during January and were: 1st quality $100, 2nd quality $50 to $110, 3rd quality $30 to $95. In Kedah the price of first quality dried leaf was $42, and in Malacca $32 to $36. The range elsewhere was: Perak Central 1st quality $35 to $39, 2nd quality $18 to $32, 3rd quality $12 to $22; Perak South $40 to $45, $35 to $40, $30 to $35, prepared tobacco 65 to 75 cents per kati; Pahang $25 to $35, $15 to $25, $10 to $17; Selangor $1 to $1.30 per kati cut tobacco.

The above prices are based on London and Singapore daily quotations for rubber, on the Singapore daily prices for copra, on the Singapore Chamber of Commerce Weekly Reports for the month and on other local sources of information. Palm oil reports and certain coffee prices are kindly supplied by Guthrie & Co., Ltd., Kuala Lumpur, local palm oil prices by Whittall & Co., Kuala Lumpur, the Singapore prices of imported coffee and arecanuts by Lianqui Trading Company of Singapore, and Singapore derris prices by Hooglandt & Co., Singapore.

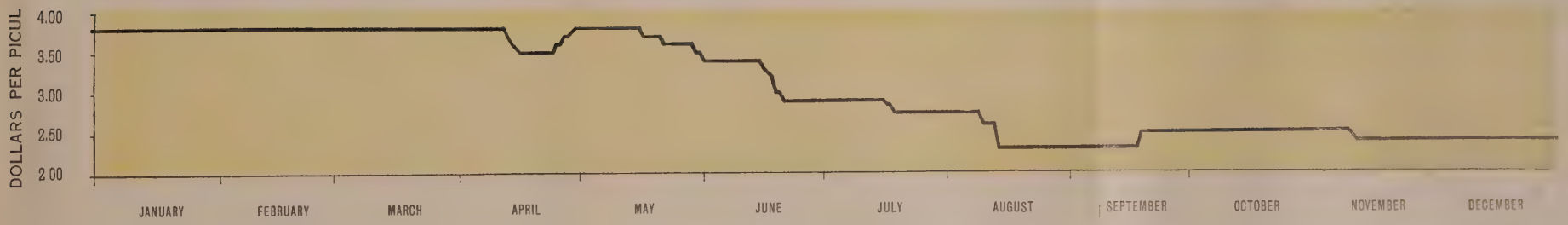
1 picul = 133 1/3 lbs. The dollar is fixed at 2s. 4d.

Note.—The Department of Agriculture will be pleased to assist planters in finding a market for agricultural produce. Similar assistance is also offered by the Malayan Information Agency, 57, Trafalgar Square, London, W.C.2.

COPRA "SUNDRIED"

SINGAPORE DAILY MARKET PRICES 1940

Supplement to
The Malayan Agricultural Journal, February 1941.

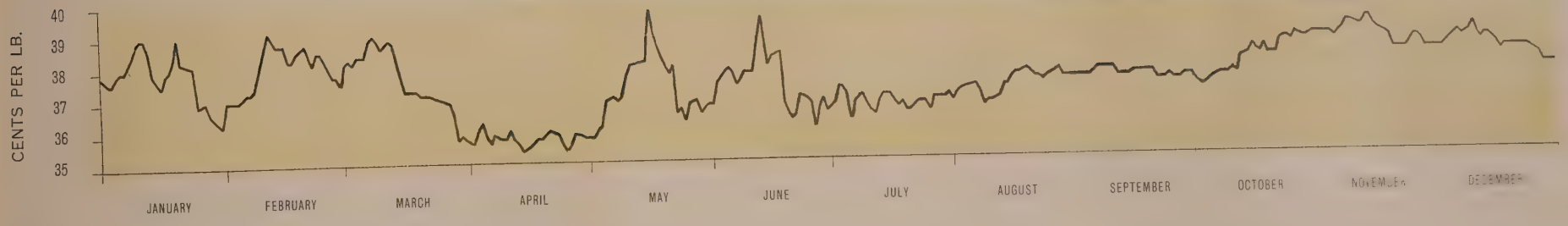


INST ENT
1941
As. 17

RUBBER

SINGAPORE DAILY MARKET PRICES 1940

Supplement to
The Malayan Agricultural Journal, February 1941.



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MALAYAN PRODUCTION OF PALM OIL AND KERNELS

(In long tons, as declared by Estates)

Month 1940	Palm Oil			Palm Kernels		
	F.M.S.	U.M.S.	Malaya	F.M.S.	U.M.S.	Malaya
January ...	2,007.6	2,474.0	4,481.6	434.3	497.0	931.3
February ...	1,937.9	1,914.7	3,852.6	411.1	454.0	865.1
March ...	2,081.5	1,877.0	3,958.5	445.3	388.1	833.4
April ...	2,104.3	1,820.7	3,925.0	420.8	370.0	790.8
May ...	2,124.3	2,054.1	4,178.4	414.5	401.0	815.5
June ...	2,128.8	2,696.0	4,824.8	268.6	505.0	773.6
July ...	3,217.7	2,886.4	6,104.1	531.4	529.2	1,060.6
August ...	3,801.2	3,049.9	6,851.1	343.1	389.8	732.9
September ...	3,323.7	2,490.6	5,814.3	296.1	294.0	590.1
October ...	2,747.4	2,459.3	5,206.7	381.6	464.0	845.6
November ...	2,351.9	2,504.8	4,856.7	344.7	462.0	806.7
December ...	2,048.9	1,869.4	3,918.3	221.6	344.0	565.6
Total ...	29,875.2	28,096.9	57,972.1	4,513.1	5,098.1	9,611.2
Total January to December, 1939 ...	30,157.7	27,215.0	57,372.7	5,639.3	4,533.1	10,172.4

Stocks on Estates as at 31st December, 1940, were :— palm oil 5,470 tons, palm kernels 1,653 tons.

FERTILIZER PRICES, FEBRUARY, 1941.

The following are the prices current for the month of February, 1941, of the more important fertilizers of which stocks are available.

	per ton $	
Nitrate of soda	125	
Muriate of potash	200	
Rock phosphate (Christmas Island)	37	($35 Singapore).
Lime	20	

Quotations are *ex* warehouse, Port Swettenham, Klang, Singapore and Penang.

Supplies of sulphate of ammonia, superphosphate, basic slag, calcium cyanamide, sulphate of potash, and rock phosphate (Gafsa) are not available.

ACREAGES OF TAPPABLE RUBBER ACTUALLY TAPPED AND NOT TAPPED ON ESTATES OF 100 ACRES AND OVER, FOR THE MONTH ENDING 31ST DECEMBER, 1940.

STATE OR TERRITORY	Estimated Acreages of Tappable Rubber (9)+(11)	ACREAGES OF TAPPABLE RUBBER NOT TAPPED				Area of tappable rubber never been tapped (b)		Total area not tapped (3)+(5) (c)		TOTAL AREA TAPPED DURING THE MONTH		Area of tappable rubber rested under rotational systems (c)	
		On estates which have entirely ceased tapping		On estates which have partly ceased tapping (a)									
		Acreage	Percentage of (3) to (2)	Acreage	Percentage of (5) to (2)	Acreage	Percentage of 7) to (2)	Acreage	Percentage of (9) to (2)	Average	Percentage of (11) to (2)	Acreage	Percentage of (13) to (2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
S.S.—													
Province Wellesley ...	42,339	114	0.3	5,727	13.5	347	0.8	5,841	13.8	36,498	86.2	8,221	19.4
Malacca ...	112,468	798	0.7	10,535	9.4	627	0.6	11,333	10.1	101,135	89.9	17,163	15.3
Penang ...	2,600	nil	nil	621	23.9	35	1.3	621	23.9	1,979	76.1	60	2.3
Singapore ...	29,645	3,353	11.3	5,253	17.7	403	1.4	8,606	29.0	21,039	71.0	2,437	8.2
Total S.S. ...	187,052	4,265	2.3	22,136	11.8	1,412	0.8	26,401	14.1	160,651	85.9	27,881	14.9
F.M.S.—													
Perak ...	275,472	972	0.4	19,874	7.2	3,601	1.3	20,846	7.6	254,626	92.4	33,461	12.1
Selangor ...	304,132	1,048	0.3	17,512	5.8	3,242	1.1	18,560	6.1	285.572	93.9	34,829	11.5
Negri Sembilan ...	251.993	1,723	0.7	25,984	10.3	4,183	1.7	27,707	11.0	224,286	89.0	24,996	9.9
Pahang ...	85,265	301	0.3	9,771	11.5	3,565	4.2	10,072	11.8	75,193	88.2	5,363	6.3
Total F.M.S. ...	916,862	4,044	0.4	73,141	8.0	14,591	1.6	77,185	8.4	839,677	91.6	98,649	10.8
U.M.S.—													
Johore ...	469,142	6,345	1.3	50,013	10.7	23,126	4.9	56,358	12.0	412,784	88.0	51,265	10.9
Kedah ...	194,318	2,850	1.5	8,844	4.5	3,610	1.9	11,694	6.0	182,624	94.0	26,577	13.7
Kelantan ...	30,254	403	1.3	4,293	14.2	793	2.6	4,696	15.5	25,558	84.5	4,123	13.6
Trengganu (d) ...	4,817	nil	nil	nil	nil	nil	nil	nil	nil	4,817	100.0	1,515	31.5
Perlis (e) ...	1,329	nil	nil	345	26.0	76	5.7	345	26.0	984	74.0	232	17.5
Brunei ...	6,118	nil	nil	1,077	17.6	314	5.1	1,077	17.6	5,041	82.4	907	14.8
Total U.M.S. ...	705,978	9,598	1.4	64,572	9.1	27,919	4.0	74,170	10.5	631,808	89.5	84,619	12.0
Total MALAYA ...	1,809,892	17,907	1.0	159.849	8.8	43,922	2.4	177,756	9.8	1,632,136	90.2	211,149	11.7

Notes.—(*a*) Area out-of-tapping on estates which have partly ceased tapping refers to areas definitely being rested and excludes areas on any tapping round.

(*b*) The acreage shown in column (7) is included in columns (3) and (5).

(*c*) Areas of tappable rubber rested under rotational systems are not considered as out-of-tapping and therefore columns (11) and (12) include columns (13) and (14) respectively.

(*d*) Registered companies only.

MALAYAN RUBBER STATISTICS Table I.

Acreage, Stocks, Production, Imports and Exports of Rubber, including Latex, Concentrated Latex and Revertex, for the month of December, 1940, in Dry Tons

State or Territory	Stocks at beginning of month 1			Production by Estates of 100 acres and over		Production by Estates of less than 100 acres estimated 2		Imports				Exports including re-exports				Stocks at end of month			Consumption 3	
								during the month		January to Dec. 1940		during the month		January to Dec. 1940						
	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to Dec. 1940	during the month	Jan. to Dec. 1940	Foreign	From Malay States	Foreign	From Malay States	Foreign	Local	Foreign	Local	Ports	Dealers	Estates of 100 acres and over	during the month	Jan. to Dec. 1940
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Malay States :—																				
Federated Malay States ...	...	5,158	17,767	17,509	177,328	10,433	102,986	Nil	Nil	Nil	Nil	16,828	7,539	181,813	101,164	...	7,414	18,940	146	1,157
Johore ...	...	1,983	7,451	7,910	80,056	5,821	63,123	Nil	28	Nil	690	3,380	10,641	43,333	102,354	...	2,493	6,679	...	...
Kedah ...	...	369	3,882	4,515	42,820	2,002	17,216	Nil	Nil	Nil	Nil	2,227	3,488	22,739	39,047	...	656	4,397	...	...
Perlis ...	...	32	41	20	207	50	400	Nil	Nil	Nil	Nil	Nil	77	Nil	605	...	39	27	...	...
Kelantan ...	...	178	511	435	5,049	798	10,011	Nil	Nil	Nil	Nil	268	931	2,553	12,787	...	270	453	...	...
Trengganu ...	...	35	145	184	2,236	383	4,317	Nil	Nil	Nil	Nil	10	575	40	6,669	...	41	121	...	...
Brunei ...	...	11	62	74	768	136	1,172	...	...	...	...	...	239	...	1,976	...	1	43	...	...
Total Malay States	...	7,766	29,859	30,647	308,464	19,623	199,225	Nil	28	Nil	690	22,713	23,490	250,478	264,602	...	10,914	30,660	146	1,157
S. Settlements :—																				
Malacca ...	...	1,720	1,674	1,791	17,004	1,145	10,066	Nil		Nil		3,142		33,558		...	2,436	1,695	...	...
Province Wellesley ...	...	1,594	744	675	6,608	432	3,304	Nil		Nil		10,945		117,440		...	1,963	796	...	...
Penang ...	3,118	3,561	13	32	281	131	1,303	2,864	24,422	29,450	256,536		Nil		Nil	2,809	4,046	15	...	...
Singapore ...	15,217	11,882	303	196	2,051	70	836	10,610		204,159		32,765		371,291		10,054	9,864	270	22	225
Labuan ...	...	20	Nil	Nil	Nil	24	185	67		710		Nil		Nil		...	38	Nil	...	...
Total Straits Settlements ...	18,335	18,777	2,734	2,694	25,944	1,802	15,694	13,541	24,422	234,319	256,536	46,852	Nil	522,289	Nil	12,863	18,347	2,776	22	225
Total Malaya ...	18,335	26,543	32,593	33,341	334,408	21,425	214,919	13,541	24,450	234,319	257,226	69,565	23,490	772,767	264,602	12,863	29,261	33,436	168	1,382

TABLE II
DEALERS' STOCKS, IN DRY TONS 3

Class of Rubber	Federated Malay States	S'pore	Penang	P.We'sly M'cca, Labuan & Brunei	Johore	Kedah
22	23	24	25	26	27	28
Dry Rubber	6,248	8,680	3,595	3,778	1,773	339
Wet Rubber	1,166	1,184	451	660	720	317
Total ...	7,414	9,864	4,046	4,438	2,493	656

TABLE III
FOREIGN EXPORTS

PORTS	For month	Jan. to Dec. 1940
29	30	31
Singapore ...	45,237	526,381
Penang ...	15,937	160,403
Port Swettenham.	8,391	84,228
Malacca ...	Nil	1,755
Total ...	69,565	772,767

TABLE IV
DOMESTIC EXPORTS 4

AREA	For month	Jan. to Dec. 1940
32	33	34
Malay States ...	46,173	513,961
Straits Settlements	3,992	40,849
Malaya ...	50,165	554,810

Notes:—

1. Stocks on estates of less than 100 acres and stocks in transit on rail, road or local steamer are not ascertained
2. The production of estates of less than 100 acres is estimated from the formula : Production + Imports + Stocks at beginning of month = Exports + Stocks at end of month, + Consumption, *i.e.*, Column [7] = Columns [13] + [14] + [17] + [18] + [19] + [20] — [2] — [3] — [4] — [5] — [9] — [10]. For the Straits Settlements the production of estates of less than 100 acres is represented by sales or exports as shown by cess paid.
3. Dealers' stocks in the Federated Malay States are reduced to dry weights by the following fixed ratios: unsmoked sheet, 15% wet sheet, 25% scrap, lump, etc., 40%; stocks elsewhere are in dry weights as reported by the dealers themselves.
4. Columns (33) and (34) represent exports of rubber subject to regulation which, for Singapore and Penang Islands are represented by sales or exports as shown by cess paid.
5. All statements are brought up to date monthly, and any inaccuracies that may be disclosed are corrected in the totals; the latest publication therefore, is always the most reliable.
6. The above, with certain omissions, is the Report published by the Registrar-General of Statistics, S.S and F.M.S., at Singapore on 25th January, 1941

METEOROLOGICAL SUMMARY, MALAYA, DECEMBER, 1940.

Locality.	Air Temperature in degrees Fahrenheit							Earth Temperature		Rainfall								Bright Sunshine.		
	Means of			Absolute Extremes						Total.		Most in a day.	Number of days.					Total.	Daily Mean.	Per cent.
	A. Max.	B. Min.	Mean of A and B	Highest Max.	Lowest Min.	Lowest Max.	Highest Min.	At 1 foot	At 4 feet			Amt.	Precipitation .01 in or more	Precipitation, .04 in or more	Thunder-storm	Fog morning obs.	Gale force 8 or more			
	°F	°F	°F	°F	°F	°F	°F	°F	°F	in.	mm.	in.						hrs.	hrs.	
Kuala Lumpur Aerodrome Selangor ...	90.5	72.5	81.5	94	68	83	75	84.3	85.3	5.37	136.4	2.09	16	11	7	9	—	186.40	6.01	51
Port Swettenham Aerodrome, Selangor ...	88.7	72.0	80.3	91	68	82	75	84.7	85.1	9.27	235.5	1.74	16	12	3	—	—	197.55	6.37	53
Sitiawan, Perak ...	88.3	73.0	80.7	92	69	84	75	82.1	83.3	15.30	388.6	3.97	17	17	3	—	—	220.85	7.12	60
Ipoh Aerodrome, Perak ...	89.9	71.9	80.9	93	69	85	74	82.9	84.0	8.24	209.3	1.97	17	14	—	—	—	217.65	7.02	59
Temerloh, Pahang ...	87.3	72.0	79.7	91	68	79	74	84.4	86.0	4.44	112.8	0.75	16	13	—	9	—	174.75	5.64	47
Kuala Lipis, Pahang ...	86.7	71.2	78.9	91	67	78	73	82.0	84.0	10.85	275.6	2.60	19	18	1	28	—	165.85	5.35	45
Kuala Pahang, Pahang ...	83.4	74.0	78.7	87	71	78	76	82.5	84.9	16.17	410.7	2.21	21	19	—	—	—	159.90	5.16	43
Kallang Aerodrome, S'pore ...	86.2	74.3	80.3	90	72	79	76	81.8	83.4	10.99	279.1	3.80	20	19	5	—	—	163.40	5.27	43
Bayan Lepas Aerodrome Penang ...	87.4	73.8	80.6	90	72	82	76	84.1	84.7	7.81	198.4	3.85	15	12	1	—	—	223.50	7.21	61
Malacca Town, Malacca ...	86.2	73.5	79.9	89	71	81	75	82.3	83.9	5.94	150.9	1.65	16	15	3	—	2	196.90	6.35	53
Kluang, Johore ...	86.1	71.9	79.0	90	69	80	74	81.0	82.4	8.89	225.8	2.15	17	15	3	4	—	144.15	4.65	39
Mersing, Johore ...	82.9	73.2	78.1	88	70	78	78	80.6	81.7	27.16	689.9	4.58	20	19	1	1	1	134.55	4.34	36
Alor Star, Kedah ...	88.2	72.2	80.2	92	68	80	74	83.7	85.7	4.54	115.3	1.63	9	6	1	—	—	229.65	7.41	62
Kota Bahru, Kelantan ...	84.2	72.2	78.2	89	69	75	75	80.3	83.1	28.50	723.9	7.47	23	19	—	—	—	160.90	5.19	44
Kuala Trengganu, Trengganu	83.9	72.6	78.3	89	68	79	78	80.3	82.9	22.58	573.5	5.03	21	18	2	2	—	173.60	5.60	47
Labuan ...	86.3	76.7	81.5	90	73	84	81	84.7	86.1	6.46	164.1	2.13	16	13	1	—	—	262.55	8.47	72
HILL STATIONS.																				
Fraser's Hill, Pahang 4268 ft.	71.3	61.4	66.3	77	58	64	63	71.0	71.7	9.24	234.7	3.11	19	18	1	17	1	143.35	4.62	39
Cameron Highlands, Tanah Rata, Pahang 4750 ft. ...	71.3	56.3	63.8	75	48	65	62	69.1	69.5	11.13	282.7	2.31	17	16	2	—	5	144.10	4.65	39
Cameron Highlands, Rhododendron Hill, Pahang 5120 ft. ...	71.6	59.0	65.3	77	55	65	61	*	*	10.57	268.5	2.50	16	14	—	—	5	154.35	4.98	42

* Not recorded.

THE

Malayan Agricultural Journal.

Edited by the Agricultural Economist with the assistance of
The Publicity Committee.

Vol. XXIX MARCH, 1941 No. 3.

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